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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,185	11/16/2001	Lee Kirby Jameson	17,090A	8720

7590

04/02/2003

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EXAMINER

LIANG, LEONARD S

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 04/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/991,185

Applicant(s)

JAMESON ET AL.

Examiner

Leonard S Liang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

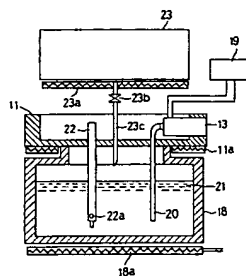
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 7, and 12-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Shiga (US Pat 4961081).

Shiga discloses:

- {claim 1} An apparatus for the discrete and registered placement of chemistry (figure 9); at least one solenoid valve, the valve containing an orifice (figure 9, reference 23b); at least one chemistry source, in communication with the at least one valve, and capable of communicating at least one chemistry to at least one solenoid valve (figure 9, reference 23; column 1, lines 53-60); a heating element; wherein the heating element is positioned proximate to at least one chemistry, and wherein the heating element allows the apparatus to process phase-change materials (figure 9, reference 23a; column 1, lines 47-61)

FIG. 9
(PRIOR ART)



- {claim 2} a control means adapted to operate the at least one solenoid valve; wherein the control means is in communication with the at least one solenoid valve (column 1, lines 47-61; control means inherent to CPU)
- {claim 3} the at least one chemistry source is selected from a reservoir or a continuous feed system (figure 9, reference 23; column 1, lines 47-61)

- {claim 4} the at least one solenoid valve is controlled so as to discharge the at least one chemistries in a pattern (column 1, lines 47-61; inherent in the output from the level detector to the CPU)
- {claim 7} the apparatus discharges discrete segments of chemistry (column 1, lines 38-61)
- {claim 12} the temperature sensor measures the temperature of the at least one chemistry in the apparatus (column 1, lines 55-57)
- {claim 13} the control means is capable of operation in multiple modes (column 1, lines 38-61; CPU can keep the solenoid valve closed (first mode) or open it (second mode))
- {claim 14} the apparatus can apply the chemistry to a substrate so as to create a topography of chemistry (column 1, lines 38-46)
- {claim 15} A printing device for the registered placement of phase-change liquids comprising at least one solenoid valve, the valve having a discharge orifice; a heating element, the element being capable of providing heat to the device so as to allow the utilization of phase-change liquids; a chemistry supply, the supply being in fluid communication with at least one solenoid valve; a control means, adapted to operate with the at least one solenoid valve (figure 9; column 1, lines 38-61)
- {claim 16} the chemistry supply is a reservoir (figure 9, reference 23; column 1, lines 47-61)
- {claim 17} the valve projects from the orifice droplets of chemistry, containing, at least in part, one or more phase-change liquids (column 1, lines 38-61)
- {claim 18} the valve projects discrete segments of droplets of chemistry, containing, at least in part, one or more phase-change liquids (column 1, lines 38-61)
- {claim 19} A method of placing one or more chemistries in a discrete and registered fashion; providing a valve jet, the jet comprising: at least one solenoid valve, the valve containing an orifice; at least one chemistry source, the at least

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one chemistry source in communication with the at least one valve, and the at least one chemistry source is capable of communicating at least one chemistry to at least one solenoid valve; and a heating element; wherein the heating element is positioned proximate to at least one chemistry, and wherein the heating element allows the apparatus to process phase-change materials; providing an amount of chemistry; communicating the chemistry from at least one chemistry source to at least one solenoid valve; providing heat to at least one chemistry; and discharging at least one chemistry from at least one solenoid valve (figure 9; column 1, lines 38-61)

- {claim 20} providing a substrate; wherein the discharged chemistry forms discrete segments on the substrate (column 1, lines 38-61; ink inherently forms discrete segments on paper)
- {claim 21} the chemistry is applied in one application to a substrate so as to create a topography of chemistry (column 1, lines 38-46)
- {claim 22} the solenoid valves comprise a discharge orifice (column 1, lines 59-61)
- {claim 23} discharging the chemistry from the at least one solenoid valve comprises firing one or more of the at least one valves (column 1, lines 59-61; “energizes” implies firing)
- {claim 24} regulating the discharge of the chemistry from the at least one solenoid valves (column 1, lines 53-61); wherein the valve jet further comprises a control element; wherein the control element is in communication with the at least one solenoid valves; and wherein the control element regulates the solenoid valves such that the chemistry is discharged onto the substrate in a pattern (column 1, lines 38-61)
- {claim 25} the control element provides for real-time adjustment of the discharge from the at least one solenoid valve (column 1, lines 47-61)

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- {claim 26} the discrete segments have a substantially semicircular cross-section extending above the substrate (column 1, lines 38-46; as ink falls to paper, gravity causes it to inherently assume a semicircular cross-section)
- {claim 27} the at least one chemistry is selected from inks (column 1, lines 38-61)
- {claim 28} at least one chemistry is a phase-change material (column 1, lines 38-61)
- {claim 29} the substrate is selected from paper (column 1, line 45)
- {claim 30} the discrete segments are applied to the substrate so as to create bond points (column 1, lines 38-46; inherent because ink must bond to paper in order to print image)
- {claim 31} the discrete segments bond points are interfiber bond points (column 1, lines 38-46; inherent because paper comprises fiber)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiga (US Pat 4961081) in view of Kimura et al (JP Pat 04336251 A).

Shiga discloses, with respect to claims 5-6, an apparatus (as taught in claim 1).

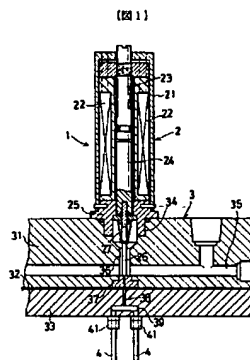
Shiga differs from the claimed invention in that it does not disclose:

- {claim 5} a manifold plate and wherein the at least one valve is positioned in the manifold plate
- {claim 6} at least one chemistry is passed through the manifold to at least one solenoid valve

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Kimura et al discloses:

- {claim 5} a manifold plate and wherein the at least one valve is positioned in the manifold plate (figure 1, reference 1-3; abstract)
- {claim 6} at least one chemistry is passed through the manifold to at least one solenoid valve (figure 1, reference 1-3; abstract)



It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Kimura et al into the invention of Shiga so that there is a manifold plate, at least one valve is positioned in the manifold plate, and at least one chemistry is passed through the manifold to at least one solenoid valve. The motivation for the skilled artisan in doing so is to gain the benefit of printing a stable line at a high speed (abstract).

3. Claims 8 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiga (US Pat 4961081) in view of Mutz et al (US Pgpud 20030048341).

Shiga discloses:

- {claim 8} An apparatus (as taught in claim 7)
- {claim 33} A method (as taught in claim 20)

Shiga differs from the claimed invention in that it does not disclose that the discrete segments have a volume of between about 5 nanoliters and about 400 nanoliters.

Mutz et al discloses, with respect to claims 8 and 33, that the discrete segments have a volume of between about 5 nanoliters and about 400 nanoliters.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Mutz et al into the invention of Shiga so that the discrete segments have a volume of between about 5 nanoliters and about 400 nanoliters. The motivation for the skilled artisan in doing so is to gain the benefit of using focused acoustic energy in the ejection of smaller than nanoliter volumes of fluids (page 1, paragraph 0002).

4. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiga (US Pat 4961081) in view of Cross et al (US Pat 4378564).

Shiga discloses:

- {claim 9} An apparatus (as taught in claim 7)
- {claim 11} An apparatus (as taught in claim 1)

Shiga differs from the claimed invention in that it does not disclose:

- {claim 9} the discrete segments have a length and width less than about 2 mm and greater than about 0.2 mm
- {claim 11} a pressure source, wherein the pressure source maintains adequate pressure in the apparatus so as to assist in the regulation of the chemistry discharge from the at least one orifice

Cross et al discloses:

- {claim 9} the discrete segments have a length and width less than about 2 mm and greater than about 0.2 mm (column 2, lines 8-10; nozzle orifices determine segment size)
- {claim 11} a pressure source, wherein the pressure source maintains adequate pressure in the apparatus so as to assist in the regulation of the chemistry discharge from the at least one orifice (abstract; column 1, lines 62-68)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Cross et al to the teachings of Shiga so that the discrete segments have a length and width less than about 2 mm and greater than about 0.2 mm, and so that there is a pressure source which maintains adequate pressure in the apparatus so as to assist in the regulation of the chemistry discharge from the at least one orifice. The

motivation for the skilled artisan in doing so is to gain the benefit of constructing a simple, dependable, and economical printing apparatus suitable for printing large size alpha-numeric characters (column 1, lines 53-57).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiga (US Pat 4961081) in view of Yaegashi et al (US Pat 5270730).

Shiga discloses, with respect to claim 10, an apparatus (as taught in claim 7).

Shiga differs from the claimed invention in that it does not disclose that the discharged segments are discharged at a frequency between about 1 Hz and about 2 kHz.

Yaegashi discloses, with respect to claim 10, that the discharged segments are discharged at a frequency between about 1 Hz and about 2 kHz (column 12, lines 38-39).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Yaegashi et al into the invention of Shiga so that the discharged segments are discharged at a frequency between about 1 Hz and about 2 kHz. The motivation for the skilled artisan in doing so is to gain the benefit of ejecting a normal solid recording material (column 1, lines 10-16).

6. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiga (US Pat 4961081) in view of Ball (US Pat 4684956).

Shiga discloses, with respect to claim 32, a method (as taught in claim 19).

Shiga differs from the claimed invention in that it does not disclose that the viscosity of the at least one chemistry discharged from the valve jet is between about 1 centipoise and about 300 centipoise at the time of discharge.

Ball discloses, with respect to claim 32, that the viscosity of the at least one chemistry discharged from the valve jet is between about 1 centipoise and about 300 centipoise at the time of discharge (column 7, lines 18-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Ball into the invention of Shiga so that the viscosity of the at least one chemistry discharged from the valve jet is between about 1 centipoise and about 300 centipoise at the time of discharge. The motivation for the skilled artisan in doing

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so is to gain the benefit of properly operating a non-contact ink jet printing apparatus to apply a composition to a moving substrate as a series of discrete droplets (column 7, lines 18-25).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Daggett et al (US Pat 4870430) discloses a solid ink delivery system.

Michael et al (US Pat 5969731) discloses a print head servicing system and method employing a solid liquefiable substance.

Sousa et al (US Pat 4870431) discloses an ink jet priming system.

Hennig (US Pat 5793398) discloses a hot melt ink shademarking system for use with automatic fabric spreading apparatus.

Ramsay (US Pat 4982200) discloses a fluid jet printing device.

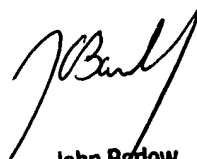
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S Liang whose telephone number is (703) 305-4754. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (703) 308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

lsl

March 26, 2003


John Barlow
Supervisory Patent Examiner
Technology Center 2800